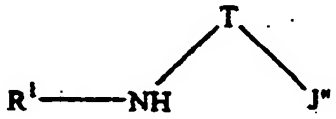
CLAIM AMENDMENTS:

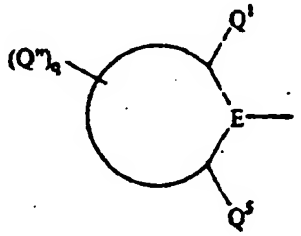
Claims 1-30. (Canceled)

31. (Presented previoiusly) A process for the stereospecific polymerization of an alpha-olefin, comprising polymerizing at least one alpha-olefin in the presence of a catalyst composition, optionally in the presence of one or more activators, under polymerization conditions, wherein the catalyst composition is formed from a mixture which comprises:

(1) a ligand characterized by the following general formula:



wherein R^1 is characterized by the general formula:



wherein E is either carbon or nitrogen,

Q^1 and Q^5 are substituents on the R^1 ring at a position ortho to E, with Q^1 and Q^5 are independently selected from the group consisting of alkyl, substituted alkyl, cycloalkyl,

substituted cycloalkyl, aryl, substituted aryl and silyl, but provided that Q^1 and Q^5 are not both methyl;

Q''_q represents additional possible substituents on the ring, with q being 1, 2, 3, 4 or 5 and Q'' being selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof;

T is a bridging group selected group consisting of $-CR^2R^3-$ and $-SiR^2R^3-$ with R^2 selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof; R^3 selected from the group consisting of aryl, substituted aryl, heteroaryl, and substituted heteroaryl; and provided that R^2 is different from R^3;

J'' is selected from the group consisting of heteroaryl and substituted heteroaryl;

(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates,

sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

32. (Original) The process of claim 31, wherein said alpha olefin is propylene.

33. (Previously presented) The process of claim 31, further comprising providing a reactor with at least one polymerizable monomer and providing the catalyst composition or mixture to said reactor.

34. (Original) Isotactic polypropylene produced by polymerization of propylene with the aid of a catalyst that comprises Hf or Zr in a solution polymerization process, wherein the tacticity index value of the polypropylene does not vary by more than 0.1 when the temperature of the solution process is varied from a temperature below 90°C to a temperature above 100°C.

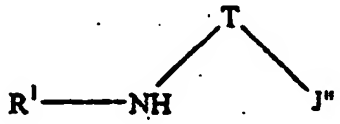
35. (Previously presented) Isotactic polypropylene produced by polymerization of propylene with the aid of a catalyst that comprises Hf or Zr in a solution polymerization process, wherein the melting point of the polypropylene does not vary by more than 10°C when the temperature of the solution process is varied from a temperature below 90°C to a temperature above 100°C.

36. (Previously presented) Isotactic polypropylene produced by polymerization of propylene with the aid of a catalyst that comprises Hf or Zr in a solution polymerization process, wherein the temperature of the solution process is at least 110°C and the polypropylene has a weight average molecular weight of at least 100,000.

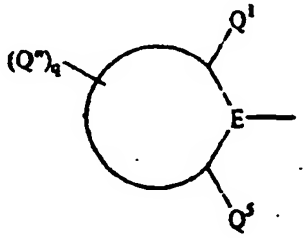
37. (Original) The isotactic polypropylene of either of claims 34 or 35, wherein said solution process is operated at a temperature at or above 110°C.

38. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a ligand characterized by the following general formula:



wherein R^1 is characterized by the general formula:



wherein E is either carbon or nitrogen,

Q^1 and Q^5 are substituents on the R^1 ring at a position ortho to E, with Q^1 and Q^5 are independently selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl and silyl, but provided that Q^1 and Q^5 are not both methyl;

Q''_q represents additional possible substituents on the ring, with q being 1, 2, 3, 4 or 5 and Q'' being selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof;

T is a bridging group selected group consisting of $-CR^2R^3-$ and $-SiR^2R^3-$ with R^2 selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof; R^3 selected from the group consisting of aryl, substituted aryl, heteroaryl, and substituted heteroaryl; and provided that R^2 is different from R^3;

J'' is selected from the group consisting of heteroaryl and substituted heteroaryl;

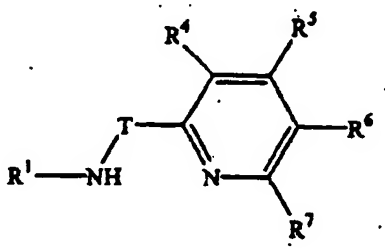
(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl,

substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

39. (Previously Presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a ligand characterized by the formula:



wherein each of R^4, R^5, R^6 and R^7 is independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof; and optionally, any combination of R^1, R^2, R^3, R^4, R^5, R^6 or R^7 may be joined together in a ring structure;

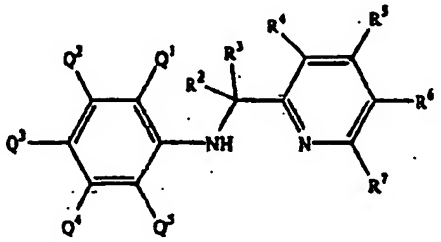
(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting

of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

40. (Previously Presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition of comprising:

(1) a ligand characterized by the general formula:



such that E is carbon and wherein Q^2, Q^3 and Q^4 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino,

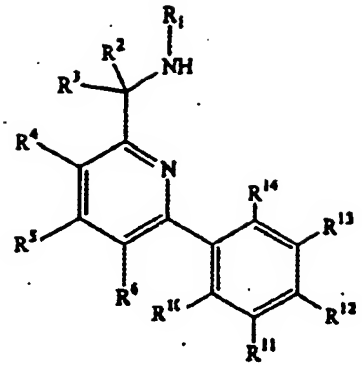
amino, thio, seleno, nitro, and combinations thereof, optionally two or more of Q^2, Q^3 and Q^4 are joined together in a ring structure;

(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

41. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a ligand characterized by the general formula:



such that T is $-CR^2R^3-$ and wherein R^{10}, R^{11}, R^{12} and R^{13} are each independently selected from the group consisting of hydrogen, halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, nitro, and combinations thereof; optionally, two or more R^{10}, R^{11}, R^{12} and R^{13} groups may be joined to form a fused ring system having from 3-50 non-hydrogen atoms; and R^{14} is selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof;

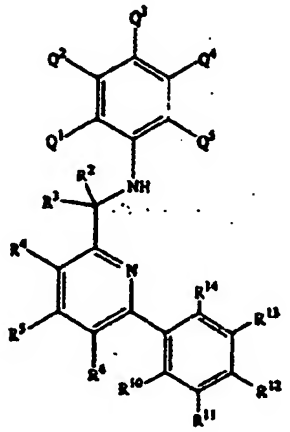
(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl,

substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

42. (Previously Presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a ligand of the formula



such that E is carbon and wherein Q^2, Q^3 and Q^4 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno,

nitro, and combinations thereof; optionally two or more of Q^2, Q^3 and Q^4 are joined together in a ring structure;

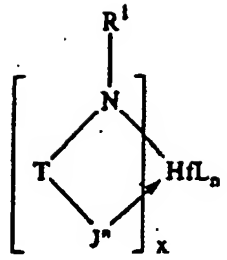
(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

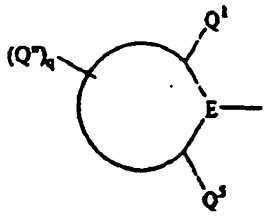
43. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst comprises hafnium.

44. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal-ligand complex characterized by the following formula:



wherein R^1 is characterized by the general formula:



wherein E is either carbon or nitrogen;

Q^1 and Q^5 are substituents on the R^1 ring at a position ortho to E, with Q^1 and Q^5 being independently selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl and silyl, but provided that Q^1 and Q^5 are not both methyl;

Q''_q represents additional possible substituents on the ring, with q being 1, 2, 3, 4 or 5 and Q" being selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof;

T is a bridging group selected group consisting of $-CR^2R^3-$ and $-SiR^2R^3-$ with R^2 selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof; R^3 selected from the group consisting of aryl, substituted aryl, heteroaryl, and substituted heteroaryl; and provided that R^2 is different from R^3;

J" is selected from the group consisting of heteroaryl and substituted heteroaryl;

each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and x is 1;

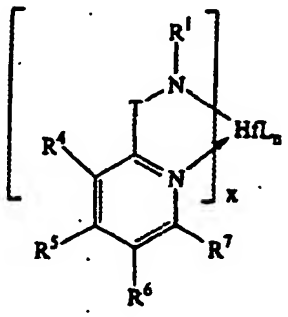
(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates,

sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

45. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal complex having the formula:



wherein each of R^4, R^5, R^6 and R^7 is independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof, and optionally, any combination of R^1, R^2, R^3, R^4 ,R^5, R^6 or R^7 may be joined together in a ring structure;

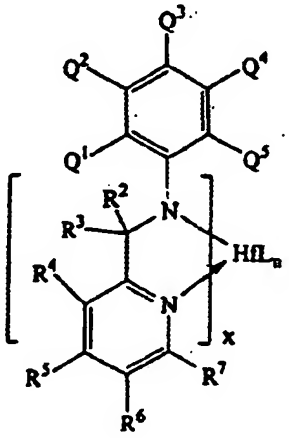
(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting

of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

46. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal complex having the formula:



such that E is carbon and wherein Q^2, Q^3 and Q^4 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl,

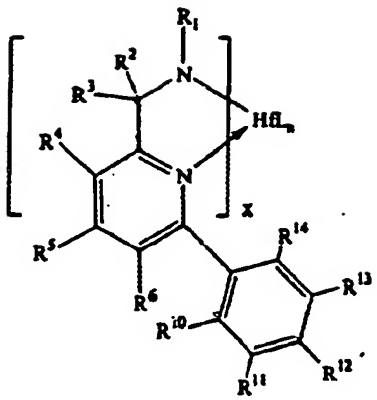
heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, nitro, and combinations thereof; optionally two or more of Q^2, Q^3 and Q^4 are joined together in a ring structure;

(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

47. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal complex, wherein said complex is characterized by the formula:



such that T is $-CR^2R^3-$ and wherein R^{10}, R^{11}, R^{12} and R^{13} are each independently selected from the group consisting of hydrogen, halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, nitro, and combinations thereof; optionally, two or more R^{10}, R^{11}, R^{12} and R^{13} groups may be joined to form a fused ring system having from 3-50 non-hydrogen atoms; and

R^{14} is selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof;

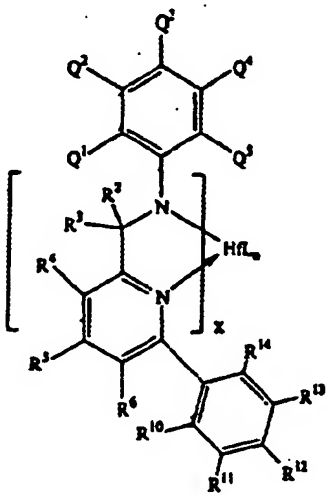
(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted

heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

48. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal complex, wherein said complex is characterized by the general formula:



such that E is carbon and wherein Q^2, Q^3 and Q^4 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl,

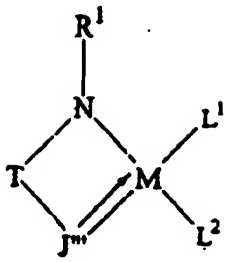
heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, nitro, and combinations thereof; optionally two or more of Q^2, Q^3 and Q^4 are joined together in a ring structure;

(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

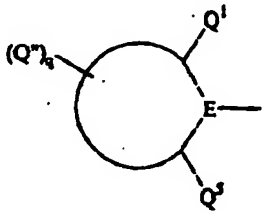
49. (Previously Presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal complex characterized by the formula:



where M is zirconium or hafnium;

wherein R^1 is characterized by the general formula:



wherein E is either carbon or nitrogen,

Q^1 and Q^5 are substituents on the R^1 ring at a position ortho to E, with Q^1 and Q^5 are independently selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl and silyl, but provided that Q^1 and Q^5 are not both methyl;

Q''_q represents additional possible substituents on the ring, with q being 1, 2, 3, 4 or 5 and Q" being selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof,

T is a bridging group selected group consisting of $-CR^2R^3-$ and $-SiR^2R^3-$ with R^2 selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof; R^3 selected from the group consisting of aryl, substituted aryl, heteroaryl, and substituted heteroaryl; and provided that R^2 is different from R^3;

J''' being selected from the group of substituted heteroaryls with 2 atoms bonded to the metal M, at least one of those 2 atoms being a heteroatom, and with one atom of J''' is bonded to M via a dative bond, the other through a covalent bond; and

L^1 and L^2 are independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally the two L groups are joined into a ring structure;

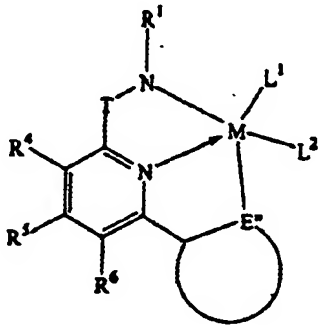
(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl,

substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

50. (Previously Presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal complex characterized by the formula:



wherein each of R^4, R^5 and R^6 is independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, halide, nitro, and combinations thereof; and optionally, any combination of R^1, R^2, R^3, R^4, R^5, or R^6 may be joined together in a ring structure; and

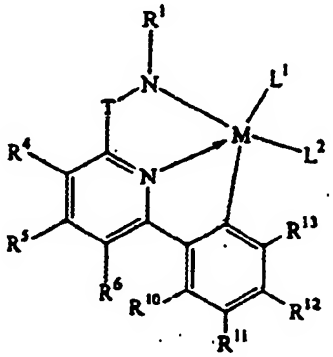
E" is either carbon or nitrogen and is part of a cyclic aryl, substituted aryl, heteroaryl, or substituted heteroaryl group;

(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

51. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal complex, wherein said complex is characterized by the formula:



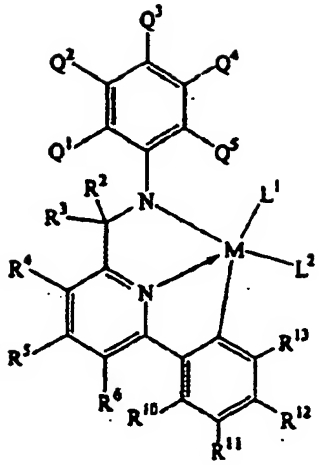
wherein R^{10}, R^{11}, R^{12} and R^{13} are each independently selected from the group consisting of hydrogen, halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, nitro, and combinations thereof; optionally, two or more R^{10}, R^{11}, R^{12} and R^{13} groups may be joined to form a fused ring system having from 3-50 non-hydrogen atoms;

(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

52. (Previously presented) The isotactic polypropylene of either of claims 34, 35 or 36, wherein said catalyst is formed from a composition comprising:

(1) a metal complex, wherein said complex is characterized by the formula:

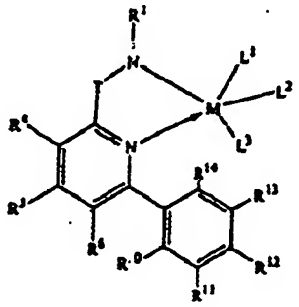


wherein Q^2, Q^3 and Q^4 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted hetercycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxyl, aryloxyl, silyl, boryl, phosphino, amino, thio, seleno, nitro, and combinations thereof; or optionally, two of Q^2, Q^3 and Q^4 are joined together in a ring structure;

(2) a metal precursor compound characterized by the general formula $M(L)_n$ wherein M is either hafnium or zirconium and each L is independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure; n is 1, 2, 3, 4, 5, or 6; and

(3) optionally, at least one activator.

53. (Original) A process for polymerizing propylene to crystalline polypropylene in a solution process, comprising contacting propylene monomer with a catalyst comprising a metal-ligand complex combined with an activator, combination of activators or activating technique, wherein at least one of said activators is a group 13 reagent and said metal-ligand complex is characterized by the formula:



where M is zirconium or hafnium;

L^1, L^2, and L^3 are independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-dionates, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally two or more L groups are joined into a ring structure;

R^1 is selected from the group consisting of 2,6-(Pr^i)$_2$-C_6H_3-; 2-Pr^i-6-Me-C_6H_3-; 2,6-Et_2-C_6H_3-; or 2-sec-butyl-6-Et-C_6H_3-;

T is a bridging group selected group consisting of $-CR^2R^3-$ and $-SiR^2R^3-$

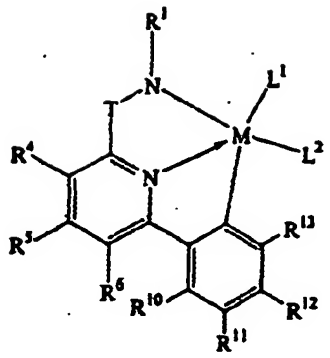
R^3 is selected from the group consisting of aryl and substituted aryl;

R^2, R^4, R^5 and R^6 are hydrogen;

either R^{10}, R^{11}, R^{12}, R^{13}, are each hydrogen; or one or more of R^{10}, R^{11}, R^{12}, R^{13} are methyl, fluoro, trifluoromethyl, methoxy, or dimethylamino; or R^{10} and R^{11} are joined to form a benzene ring and R^{12} and R^{13} are each hydrogen; and

R_{14} is either hydrogen or methyl.

54. (Original) A process for polymerizing propylene to crystalline polypropylene in a solution process, comprising contacting propylene monomer with a catalyst comprising a metal-ligand complex combined with an activator, combination of activators or activating technique, wherein at least one of said activators is a group 13 reagent and said metal-ligand complex is characterized by the formula:



where M is zirconium or hafnium;

L^1 and L^2 are independently selected from the group consisting of halide, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, hydroxy, boryl, silyl, amino, amine, hydrido, allyl, diene, seleno, phosphino, phosphine, carboxylates, thio, 1,3-diones, oxalates, carbonates, nitrates, sulphates, ethers, thioethers and combinations thereof or optionally the two L groups are joined into a ring structure;

R^1 is selected from the group consisting of 2,6(Pr^i)$_2$-C_6H_3-; 2-Pr^i-6-Me-C_6H_3-; 2,6-Et_2-C_6H_3-; or 2-sec-butyl-6-Et-C_6H_3-;

T is a bridging group selected group consisting of -CR^2R^3- and -SiR^2R^3-;

R^3 is selected from the group consisting of aryl and substituted aryl;

R^2, R^4, R^5 and R^6 are hydrogen; and

either R^{10}, R^{11}, R^{12} , R^{13}, are each hydrogen; or one or more of R^{10}, R^{11}, R^{12}, R^{13} are methyl, fluoro, trifluoromethyl, methoxy, or dimethylamino; or R^{10} and R^{11} are joined to form a benzene ring and R^{12} and R^{13} are each hydrogen.

55. (Previously presented) The process of claim 31, wherein R^2 is hydrogen.

56. (Previously presented) The process of claim 31, wherein each of R^4 , R^5 and R^6 is hydrogen.

57. (Previously presented) The process of claim 56, wherein R^3 is selected from the group consisting of benzyl, phenyl, naphthyl, 2-biphenyl, 2-dimethylaminophenyl, 2-methoxyphenyl, anthracenyl, mesityl, 2-pyridyl, 3,5-dimethylphenyl, o-tolyl, and phenanthrenyl.

58. (Previously presented) The process of claim 57, wherein Q^1 and Q^5 are both isopropyl; or both ethyl; or both sec-butyl; or Q^1 is methyl and Q^5 is isopropyl; or Q^1 is ethyl and Q^5 is sec-butyl.

59. (Previously presented) The process of claim 58, wherein R^{10}, R^{11}, R^{12}, R^{13}, are each hydrogen; or one or more of R^{10}, R^{11}, R^{12}, R^{13} are methyl, fluoro, trifluoromethyl, methoxy, or dimethylamino; or R^{10} and R^{11} are joined to form a benzene ring and R^{12} and R^{13} are each hydrogen.

60. (Previously presented) The process of claim 31, wherein each of R^4 and R^5 is hydrogen and R^6 is either hydrogen or is joined to R^7 to form a fused ring system.

61. (Previously presented) The process of claim 31, wherein R^3 is selected from the group consisting of benzyl, phenyl, naphthyl, 2-biphenyl, 2-dimethylaminophenyl, 2-methoxyphenyl, anthracenyl, mesityl, 2-pyridyl, 3,5-dimethylphenyl, o-tolyl, and phenanthrenyl.

62. (Previously presented) The process of claim 31, wherein Q^1 and Q^5 are, independently, selected from the group consisting of $-CH_2R^{15}$, $-CHR^{16}R^{17}$ and methyl, provided that not both Q^1 and Q^5 are methyl, wherein R^{15} is selected from the group consisting of alkyl, substituted alkyl, aryl and substituted aryl; R^{16} and R^{17} are independently selected from the group consisting of alkyl, substituted alkyl, aryl and substituted aryl; and optionally R^{16} and R^{17} are joined together in a ring structure having from 3-50 non-hydrogen atoms.

63. (Previously presented) The process of claim 62, wherein Q^2, Q^3, and Q^4 are each hydrogen and Q^1 and Q^5 are both isopropyl; or both ethyl; or both sec-butyl; or Q^1 is methyl and Q^5 is isopropyl; or Q^1 is ethyl and Q^5 is sec-butyl.

64. (Previously presented) The process of claim 31, wherein R^1 or the variables Q^1, Q^2, Q^3, Q^4 and Q^5 are chosen so that the R^1 moiety is selected from the group consisting of 2,6-$(Pr^i)_2$-C_6H_3-; 2-Pr^i-6-Me-C_6H_3-; 2,6-Et_2-C_6H_3-; and 2-sec-butyl-6-Et-C_6H_3-.

65. (Previously presented) The process of claim 65, wherein R^7 is aryl, substituted aryl, heteroaryl or substituted heteroaryl.

66. (Currently amended) The process of claim 65, wherein R^7 is selected from the group consisting of phenyl, [napthyl] naphthyl, mesityl, anthracenyl and phenanthrenyl.

67. (Currently amended) The [proess] process of claim 34, wherein R^{10}, R^{11}, R^{12}, R^{13}, are each hydrogen; or one or more of R^{10}, R^{11}, R^{12} , R^{13} are methyl, fluoro, trifluoromethyl, methoxy, or dimethylamino; or R^{10} and R^{11} are joined to form a benzene ring and R^{12} and R^{13} are each hydrogen.

68. (Previously presented) The process of claim 32, wherein two or more of R^4, R^5, R^6 and R^7 are joined to form a fused ring system having from 3-50 non-hydrogen atoms in addition to the pyridine ring and/or R^4, R^5 and R^6 are each independently selected from the group consisting of alkyl, aryl, halide, alkoxy, aryloxy, amino, and thio.

69. (Previously presented) The process of claim 34, wherein R^6 and R^{10} are joined to form a ring system having from 5-50 non-hydrogen atoms.

70. (Currently amended) The process of Claim 54 which further comprises ~~polymerizing propylene in the presence of a catalyst that comprises Hf or Zr in a solution polymerization process, and~~ recovering isotactic polypropylene, wherein the process ~~which~~ is characterized ~~by~~ in that when the temperature of the process is varied from a temperature below 90°C to a temperature above 100°C, a tacticity index value of the recovered isotactic polypropylene ~~which~~ does not vary by more than 0.1 ~~when the temperature of the solution process is varied from a temperature below 90°C to a temperature above 100°C.~~ and ~~which is characterized by~~ a melting point ~~which~~ of the recovered isotactic polypropylene does not vary by more than 10°C ~~when the temperature of the solution process is varied from a temperature below 90°C to a temperature above 100°C.~~

71. (Currently amended) The process of Claim 54 which further comprises ~~polymerizing propylene in the presence of a catalyst that comprises Hf or Zr in a solution polymerization process, and~~ recovering isotactic polypropylene having a weight average molecular weight of at least 100,000, wherein the process ~~which~~ is characterized ~~by Isotactic polypropylene produced by polymerization of propylene with the with the aid of a catalyst that comprises Hf or Zr in a solution polymerization process, wherein~~ in that the melting point of the polypropylene does not vary by more than 10°C when the temperature of the solution process is varied from a temperature below 90°C to a temperature above 100°C ~~and the polypropylene has a weight average molecular weight of at least 100,000~~.

72. (Currently amended) A process for producing isotactic polypropylene comprising polymerizing propylene, in the presence of a polymerization catalyst that comprises Hf or Zr,

under solution polymerization process conditions including a temperature of the solution process, ~~which is varied from a temperature below 90°C to a temperature above 100°C,~~ and producing a polypropylene which is characterized by a tacticity index value which does not vary by more than 0.1 when the temperature of the solution process is varied from a temperature below 90°C to a temperature above 100°C.

73. (Currently amended) A polymerization process for producing isotactic polypropylene, comprising polymerizing propylene, in the presence of a catalyst that comprises Hf or Zr, under solution polymerization process conditions including a temperature ~~below 90°C to a temperature above 100°C~~ of the solution process, and producing polypropylene which is characterized by a melting point which does not vary by more than 10°C when the temperature of the solution process is varied from a temperature below 90°C to a temperature above 100°C.

74. (Previously presented) A process for producing isotactic polypropylene comprising polymerizing propylene, in the presence of a catalyst that comprises Hf or Zr, under solution polymerization process conditions including a temperature of at least 110°C and producing polypropylene which has a weight average molecular weight of at least 100,000.

75. (Previously presented) A process for producing isotactic polypropylene of either of claims 34 or 35, wherein said solution process is operated at a temperature at or above 110°C.